UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DAVID STRAND,
JOSEPH ANTOCCI,
PETER MYERS,
DAVID BARROW,
JOSEPH CEFAI
and TIM MYERS

Appeal No. 2006-1460
Application No. 10/033,315

ON BRIEF

Before GARRIS, WARREN and FRANKLIN, Administrative Patent Judges.

GARRIS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal which involves claims 1-35.

The subject matter on appeal relates to a microfluidic substrate assembly comprising a multi-layer laminated substrate having a fluid inlet port and a microscale fluid flow channel, and at least one operative component mounted aboard the multi-layer laminated substrate in communication with the microscale fluid flow channel. The appealed subject matter also relates to

a method of producing a multi-layer laminated substrate. This appealed subject matter is adequately represented by independent claim 1 which reads as follows:

> 1. A microfluidic substrate assembly comprising: a multi-layer laminated substrate defining at least one fluid inlet port and at least one microscale fluid flow channel within the multi-layer substrate in fluid communication with the inlet port for transport of fluid; and
>
> at least one operative component mounted aboard the multi-layer laminated substrate in communication with the microscale fluid flow channel.

The references set forth below are relied upon by the examiner as evidence of unpatentability:

Wilding et al. (Wilding)	5,928,880	Jul. 27, 1999
Dubrow et al. (Dubrow)	6,475,364	Nov. 5, 2002
Mastrangelo et al. (Mastrangelo)	6,494,433	Dec. 17, 2002
Holl	WO 99/60397	Nov. 25, 1999

(published World Intell. Prop. Org. Patent Application)

Claims 1-6, 8-19 and 27-35 are rejected under 35 U.S.C. § 102(b) as being anticipated by Holl.

Claims 1-6 and 8-12 are rejected under 35 U.S.C. § 102(e) as being anticipated by Dubrow.

Claims 1-6 and 8-14 are rejected under 35 U.S.C. § 102(b) as being anticipated by Wilding.

Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Holl, Wilding or Dubrow in view of Mastrangelo.

Claims 20-26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Holl, Wilding or Dubrow.

Finally, claims 15-19 and 27-35 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Wilding.

We refer to the brief and to the answer for a thorough discussion of the opposing viewpoints expressed by the appellants and by the examiner concerning the above noted rejections.

Some but not all of the commonly rejected claims have been separately argued by the appellants in the manner required by 37 CFR § 41.37(c)(1)(September 13, 2004). We will individually consider these separately argued claims in resolving the issues before us on this appeal.

OPINION

For the reasons set forth in the answer and below, we will sustain each of these rejections.

THE SECTION 102 REJECTION OVER HOLL

The appellants argue that Holl fails to anticipatorily disclose the claim 1 feature of at least one operative component "mounted aboard" the multi-layer laminated substrate. According to the appellants, while Holl discloses operative components such

as valve and pump mechanisms, these "mechanisms engage interfaces on the cartridge [of Holl] rather than being mounted to the cartridge" (brief, page 15). This argument is unpersuasive.

As correctly explained by the examiner on page 8 of the answer, the claim 1 phrase "mounted aboard" encompasses the aforementioned interfacial engagement of Holl's valve and pump mechanisms. This is evinced by the appellants' specification disclosure (e.g., see the disclosure at lines 3-6 on page 17 which exemplifies a "component-on-board" as a multi-laminated substrate conduit cartridge interfaced with a multi-layer laminated manifold). The examiner's position is further supported by the appellants' drawing which illustrates an externally mounted component-on-board (e.g., see element 50 of figures 6 and 7A-B and element 60 of figure 8) which correspond to Holl's externally mounted components such as syringe pumps. Further, the appellants implicitly militate for the examiner's position and against their above noted argument by describing, in the paragraph bridging pages 7 and 8 of the brief, the claim 1 "operative component mounted aboard the multi-layer laminated substrate" as including "external component-on-board" and "removeable [sic] component" (id. at page 8). Finally, the here claimed feature under consideration is unquestionably satisfied

by the fluid reservoir of Holl's cartridge (e.g., see the first full paragraph on page 3) since an embodiment of the claim 1 "operative component" includes a "fluid reservoir" (e.g., dependent claim 3).

As for independent claim 13, the appellants argue that Holl contains "no express disclosure of vias extending between levels within a multi-layer laminated substrate for fluid communication between microscale fluid flow channel[s] of different levels" (brief, page 16). This is incorrect. Holl repeatedly teaches the presence of such vias in his microfluidic substrate assembly. See, for example, the paragraph bridging pages 4-5 and the first full paragraph on page 16.

The appellants further argue that Holl fails to expressly teach the independent claim 27 feature "wherein at least first and second layers of the multi-layer laminated substrate are selectively welded to each other to form a fluid-tight seal at least along a channel within the multi-layer laminated substrate" (see pages 16-17 of the brief). We cannot agree. The layers of Holl's multi-layer laminated substrate are explicitly disclosed as being welded to each other (e.g., see the sentence bridging pages 4-5, and the paragraph bridging pages 18-19). Moreover, as correctly indicated by the examiner, this welding is selective in

that it occurs along the edge portions of Holl's layers.

The appellants' argument regarding independent method claim 31 corresponds to the claim 27 argument. It follows that this argument is unpersuasive for reasons analogous to those set forth immediately above.

In light of the foregoing, it is our determination that the Holl reference evinces a prima facie case of anticipation which the appellants have failed to successfully rebut with argument or evidence to the contrary. We hereby sustain, therefore, the examiner's Section 102 rejection of claims 1-6, 8-19 and 27-35 as being anticipated by Holl.

THE SECTION 102 REJECTION BASED ON DUBROW

It is the appellants' contention that the rejection under consideration is improper because "[t]here is no express disclosure in Dubrow . . . of operative components mounted aboard any such device [i.e., a microfluidic substrate assembly of the type defined by independent claim 1]" (brief, page 19). This is not correct. The examiner has accurately explained in his rebuttal to this contention (and the appellants have not disagreed with this explanation) that Dubrow discloses a microfluidic device having operative components such as an electrical controller and electrodes mounted there aboard as

required by appealed claim 1. In addition, Dubrow discloses that his microfluidic device contains reservoirs, and such reservoirs also satisfy the operative component requirement of claim 1. In these respects, see the first full paragraph in column 12 and the last full paragraph in column 15 of Dubrow.

Under these circumstances, we likewise sustain the Section 102 rejection of claims 1-6 and 8-12 as being anticipated by Dubrow.

THE SECTION 102 REJECTION BASED ON WILDING

According to the appellants, "Wilding fails to teach an operative component mounted aboard a multi-layer laminated substrate [e.g., see independent claim 1]" (brief, page 19). We cannot agree. As more fully explained in the answer, the device of Wilding contains microfluidic channels and a variety of components such as pumps, pressure sensors and heating/cooling elements (e.g., see lines 27-45 in column 7 and line 66 in column 11 through line 25 in column 13).

We also cannot agree with the appellants' argument that Wilding fails to disclose the light sensor feature of dependent claim 4. Patentee repeatedly describes chromophore and optical detection (e.g., see lines 48-55 in column 14 and the paragraph

bridging columns 14-15) and specifically detection based on light absorbance (e.g., see the last paragraph in column 17 and the paragraph bridging columns 18-19).

On the other hand, we share the appellants' position that the Wilding patent contains no express teaching of the ultrasonic actuator or transducer feature recited in dependent claim 5. Although Wilding teaches that the filling of a flow passage may be assisted by vibration or other means (see lines 19-21 in column 18), we do not find and the examiner does not identify any explicit disclosure in this reference of an ultrasonic actuator or transducer for performing a vibration or other function.

Finally, we perceive no persuasive merit in the appellants' arguments concerning dependent claims 6 and 8-12.[1] Wilding unquestionably discloses the features of claims 6 and 8 (e.g., see lines 52-67 in column 16). Moreover, we agree with the examiner's contention (see the second paragraph on page 10 of the answer), which the appellants have not disputed, that patentee's

[1]The appellants' arguments regarding claims 8, 11 and 12 inappropriately relate to features which are not recited in these claims; see the last full paragraph on page 21 and the first full paragraph on page 22 of the brief.

microprocessor (see the paragraph bridging columns 12-13) satisfies the requirement for an electronic memory unit as recited in dependent claims 11 and 12.

For the above stated reasons, we hereby sustain the Section 102 rejection of claims 1-4, 6 and 8-14 as being anticipated by Wilding. However, we cannot sustain the corresponding rejection of claim 5.

THE SECTION 103 REJECTION BASED ON WILDING

The examiner has correctly observed that the appellants' argument concerning the fluid pressure requirements of claims 15 and 16 relate to anticipation rather than obviousness. Moreover, a prima facie case exists for concluding that it would have been obvious to provide the assembly of Wilding with such fluid pressure capabilities in order to effectuate the desired functions to be performed by this assembly. The appellants' arguments concerning the selective welding feature of claims 19, 27 and 31-35 are similarly deficient. Patentee clearly discloses constructing his assembly via a welding technique (e.g., see lines 25-40 in column 8), and it would have been obvious to practice this welding technique selectively in order to seal the layers together while avoiding inadvertent weld obstruction of a fluid flow channel.

We hereby sustain, therefore, the Section 103 rejection of claims 15-19 and 27-35 as being unpatentable over Wilding.

THE SECTION 103 REJECTION BASED ON HOLL, WILDING OR DUBROW

The appellants argue that the applied references contain no teaching or suggestion of constructing the assemblies thereof from the specific polymer material required by the rejected claims, namely, PEEK.[2] However, each of these references either expressly teaches or would have suggested manufacturing the assemblies thereof from appropriate polymer materials of construction (e.g., see lines 25-40 in column 8 of Wilding).

Furthermore, such reference disclosures evince that an artisan would have found it obvious to select a specific polymer material known in the prior art and suitable for construction of fluidic assemblies of the type under consideration. Under these circumstances, we agree with the examiner that it would have been obvious for the artisan to select PEEK specifically as a suitable prior art polymer material of construction for the assemblies of the applied references.

---

[2]That is, polyetheretherketone; see the paragraph bridging pages 9-10 of the appellants' specification.

It follows that we sustain the Section 103 rejection of claims 20-26 as being unpatentable over Holl, Wilding or Dubrow.

THE SECTION 103 REJECTION BASED ON HOLL, WILDING OR DUBROW IN VIEW OF MASTRANGELO

The only argument presented by the appellants in their brief with respect to this rejection is that "Mastrangelo fails to cure the deficiencies of WO 99/60397 [i.e., Holl], Wilding or DuBrow" (brief, pages 23-24). For reasons fully detailed above, we share the examiner's view that the primary references are not deficient in the manner urged by appellants. Thus, the argument under review lacks convincing merit.

Accordingly, we also sustain the Section 103 rejection of claim 7 as being unpatentable over Holl, Wilding or Dubrow in view of Mastrangelo.

SUMMARY

We have sustained each of the rejections advanced by the examiner on this appeal except for the Section 102 rejection of claim 5 as being anticipated by Wilding.

The decision of the examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

BRADLEY R. GARRIS)
Administrative Patent Judge)
)
)
) BOARD OF PATENT
CHARLES F. WARREN) APPEALS AND
Administrative Patent Judge) INTERFERENCES
)
)
)
BEVERLY A. FRANKLIN)
Administrative Patent Judge)

BRG/hh

Appeal No. 2006-1460
Application No. 10/033,315

BANNER & WITCOFF, LTD.
28 STATE STREET
28TH FLOOR
BOSTON, MA 02109-9601